IMPORT

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FINDING MODEL NUMBER

This Operator's Manual is an important part of your new tiller attachment. It will help you assemble, prepare and maintain the unit for best performance. Please read and understand what it says.



Before you start assembling your new equipment, please locate the model plate on the equipment and copy the information from it in the space provided below. The information on the model plate is very important if you need help from your local authorized Cub Cadet dealer.

You can locate the model number by looking at the left side of the tiller frame near the top. A sample model plate is explained below.

(Model Number) (Serial Number)	Copy the model number here:
CUB CADET CORP. P.O. BOX 368023 CLEVELAND, OHIO 44136	Copy the serial number here:

CALLING WARRANTY SERVICE

If you have difficulty assembling this product or have any questions regarding the controls, operation or maintenance of this unit, please call the Customer Dealer Referral Line.



Call **1-(800)-528-1009** to locate your nearest Cub Cadet dealer. Before contacting your local dealer, be sure to have your unit's model number and serial number ready. See previous section to locate this information.

SECTION 1: IMPORTANT SAFE OPERATION PRACTICES



WARNING: This symbol points out important safety instructions which, if not followed, could endanger the personal safety and/or property of yourself and others. Read and follow all instructions in this manual before attempting to operate this machine. Failure to comply with these instructions may result in personal injury. When you see this symbol—heed its warning.

DANGER: This machine was built to be operated according to the rules for safe operation in this manual. As with any type of power equipment, carelessness or error on the part of the operator can result in serious injury. This machine is capable of amputating hands and feet, and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.

General Operation

- Read this operator's manual carefully in its entirety before attempting to assemble this machine. Read, understand, and follow all instructions on the machine and in the manual(s) before operation. Be completely familiar with the controls and the proper use of this machine before operating it. Keep this manual in a safe place for future and regular reference and for ordering replacement parts.
- This machine is a precision piece of power equipment, not a plaything. Therefore, exercise extreme caution at all times. Your unit has been designed to perform one job: to till soil. Do not use it for any other purpose.
- Never allow children under 14 years old to operate this machine. Children 14 years old and over should read and understand the operation instructions and safety rules in this manual and should be trained and supervised by a parent. Only responsible individuals who are familiar with these rules of safe operation should be allowed to use your machine.
- Thoroughly inspect the area where the equipment is to be used. Remove all stones, sticks, wire, bones, toys and other foreign objects which could be picked up and thrown by the tiller tines in any direction which could cause serious personal injury to the operator or any others allowed in the area. Plan your tilling pattern to avoid discharge of material toward roads, sidewalks, bystanders and the like. To help avoid tine contact or a thrown object injury, keep children, bystanders and helpers at least 75 feet from the tiller attachment while it is in operation. Stop tiller if anyone enters the area.
- Always wear safety glasses or safety goggles during operation or while performing an adjustment or repair to protect eyes from foreign objects that may be thrown from the machine in any direction.
- Wear sturdy, rough-soled work shoes and closefitting slacks and shirts. Shirts and pants that cover the arms and legs and steel-toed shoes are recommended. Loose fitting clothes and jewelry can be caught in movable parts. Never operate a unit in bare feet, sandals, slippery or light weight (e.g. canvas) shoes.

- Do not put hands or feet near or under rotating parts. Keep clear of the tiller tines at all times as the rotating tines can cause injury.
- Never operate the tiller without the rear deflector in its proper place.
- Disengage the PTO and raise the tiller attachment when crossing gravel drives, walks, or roads.
- Watch for traffic when operating near or crossing roadways. This machine is not intended for use on any public roadway.
- Do not operate while under the influence of alcohol or drugs.
- Use tiller attachment in daylight or in good artificial light only.
- Never carry passengers.
- Slow down before turning. Operate the machine smoothly. Avoid erratic operation and excessive speed.
- Use a slow ground speed when tilling soil for the first time. Fast speeds may cause you to lose control and may also damage the machine.
- Disengage the PTO and raise the tiller attachment before shifting into reverse and backing up. Always look down and behind before and while backing up to avoid a back-over accident.
- Disengage the PTO and raise the tiller attachment before making sharp turns. Leaving the tiller lowered and engaged may adversely affect the steering and control of the tractor.
- Use extra caution when making turns, especially in tight areas or around obstacles. The tiller attachment extends beyond the back of the tractor and could strike an adjacent object (e.g. tree, fence, bystander etc.) which could damage the machine or cause personal injury.
- Check overhead clearances carefully before driving under power lines, wires, bridges, low hanging tree branches, before entering or exiting buildings, or any other situation where the operator may be struck or pulled from the unit, which could result in serious personal injury.
- Disengage the PTO and raise the tiller attachment when not in use.
- Never leave a running machine unattended. Always disengage PTO, place transmission in neutral, set

parking brake, turn engine off and remove key before dismounting.

- Disengage the PTO, stop the engine and wait until the tiller comes to a complete stop before making any repairs, adjustments, or removing any rocks or debris.
- Use extra caution when loading or unloading the machine into a trailer or truck. A tractor with a tiller attachment should not be driven up or down a ramp onto a trailer or truck under power, the unit could tip over causing serious personal injury. The unit must be pushed manually to load or unload properly.
- Follow all manufacturer's recommendations for use of counterweights to improve machine stability.
- If situations occur which are not covered in this manual, use care and good judgment. Contact your dealer for assistance. Telephone 1-800-528-1009 for the name of your nearest dealer.

Slope Operation

Slopes are a major factor related to loss of control and tip-over accidents which can result in severe injury or death. Operation on slopes requires extra caution. If you cannot back up the slope or if you feel uneasy on it, do not till it. For your safety, use the slope gauge included as part of this manual to measure slopes before operating this unit on a sloped or hilly area. If the slope is greater than 10 degrees as shown on the slope gauge, do not operate this unit on that area or serious injury could result.

Do:

- Till up and down slopes, not across. Exercise extreme caution when changing direction on slopes.
- Watch for holes, ruts, bumps, and hidden objects (e.g. rocks etc.) which can be under the soil. Uneven terrain could overturn the machine which may cause personal injury.
- Use slow speed. Choose a low enough speed setting so that you will not have to stop or shift while on the slope. Always keep the machine in gear when going down slopes to take advantage of the engine braking action.
- Keep all movements on slopes slow and gradual. Do not make sudden changes in speed or direction. Rapid engagement or braking could cause the front of the machine to lift and rapidly flip over backwards which could cause serious personal injury.
- Avoid starting and stopping on a slope. If tires lose traction, Disengage the PTO and proceed slowly straight down the slope.
- Use extra care with the tiller attachment as it can change the stability of the machine.
- Follow all manufacturer's recommendations for wheel weights or counterweights to improve the stability of the machine.

Do Not:

• Do not turn on slopes unless necessary; then, turn slowly and gradually downhill, if possible.

- Do not till near drop-offs, ditches or embankments. The machine could suddenly overturn if a wheel or the attachment is over the edge, or if the edge caves in.
- Do not operate machine on wet grass. Reduced traction could cause sliding and loss of control of the machine.
- Do not try to stabilize the machine by putting your foot on the ground.
- Do not till slopes greater than 10 degrees as shown on the slope gauge.

Children

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the machine and the tilling activity. They do not understand the dangers. Never assume that children will remain where you last saw them.

- Keep children out of the tilling area and under the watchful care of a responsible adult other than the operator.
- Be alert and turn the machine off if a child enters the area.
- Before and while moving backwards, look behind and down for small children.
- Use extreme care when approaching blind corners, doorways, shrubs, trees, or other objects that may obscure your vision of a child who may run into the machine.
- Never carry children, even with the attachment disengaged. They may fall off and be seriously injured or interfere with safe machine operation.
- Keep children away from hot or running engines. They can suffer burns from a hot muffler.
- Remove key when machine is unattended to prevent unauthorized operation.

Never allow children under 14 years old to operate a power mower. Children 14 years old and over should read and understand the operation instructions and safety rules in this manual and should be trained and supervised by a parent.

Service

Safe Handling of Gasoline:

To avoid personal injury or property damage use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive. Serious personal injury can occur when gasoline is_ spilled on yourself or your clothes which can ignite. Wash your skin and change clothes immediately.

- Use only an approved gasoline container.
- Extinguish all cigarettes, cigars, pipes and other sources of ignition.
- Never fuel machine indoors because flammable vapors will accumulate in the area.

- Never remove gas cap or add fuel while the engine is hot or running. Allow engine to cool at least two minutes before refueling.
- Never over fill fuel tank. Fill tank to no more than ½ inch below bottom of filler neck to provide space for fuel expansion.
- Replace gasoline cap and tighten securely.
- If gasoline is spilled, wipe it off the tractor's fender. Move unit to another area. Wait 5 minutes before starting the engine.
- Never store the machine or fuel container inside where there is an open flame, spark, or pilot light as on a water heater, space heater, furnace, clothes dryer, or other gas appliances.
- To reduce fire hazard, keep machine free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage and remove any fuel soaked debris.
- Allow machine to cool at least 5 minutes before storing.

General Service:

- Never run an engine indoors or in a poorly ventilated area. Engine exhaust contains carbon monoxide, an odorless and deadly gas.
- Before cleaning, repairing, or inspecting, make certain the tines and all moving parts have stopped. Disconnect the spark plug wire and ground against the engine to prevent unintended starting.
- Never attempt to make adjustments or repairs to the machine while the engine is running.
- Never check for leaks in the hydraulic lines with your hands. Hot, high pressure fluid can escape through a pin hole leak and cause serious injury by puncturing the skin and causing blood poisoning.
- Muffler, engine and belt guards become hot during normal operation and can cause a burn. Hydraulic hoses, fittings and fluid also become hot during normal operation. Allow the machine, tiller

Your Responsibility

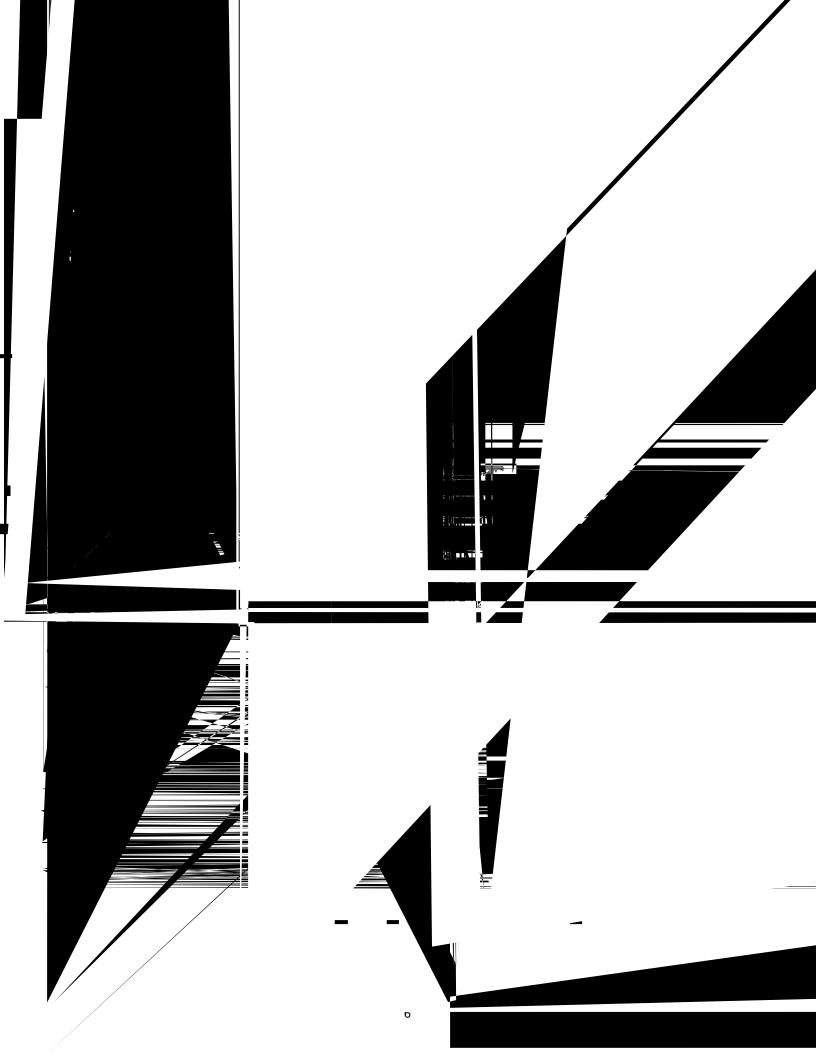
attachment, and its related hardware time to cool before cleaning, repairing, or inspecting.

- Check the tine mounting bolts at frequent intervals for proper tightness. Also, visually inspect tines for damage (e.g., bent, cracked, worn etc.) Replace tines with the original equipment manufacture's (O.E.M.) tines only, listed in this manual. "Use of parts which do not meet the original equipment specifications may lead to improper performance and compromise safety!"
- Tiller tines are sharp and can cause serious injury. Wrap the tines or wear gloves, and use extra caution when servicing them.
- Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.
- Never tamper with safety devices. Check their proper operation regularly. Use all guards as instructed in this manual.
- After striking a foreign object, stop the engine, disconnect the spark plug wire and ground against the engine. Thoroughly inspect the machine for any damage. Repair the damage before starting and operating.
- Check brake operation frequently as it is subjected to wear during normal operation. Adjust and service as required.
- If the tractor or tiller attachment should begin to vibrate abnormally, stop the engine and check over the equipment immediately for the cause. Abnormal vibration is a warning of a problem.
- Do not change the engine governor setting or overspeed the engine.
- Observe proper disposal laws and regulations. Improper disposal of fluids and materials can harm the environment.
- Maintain or replace safety and instruction labels, as necessary.



Restrict the use of this power machine to persons who read, understand and follow the warnings and instructions in this manual and on the machine. **The safety label on the equipment is reproduced below.** Take a moment to study the label before operating the unit. Always maintain safety while operating or servicing the equipment.





To connect the h assembly:

hoses to the hydraulic pump

 Locate both pump. Noti diameter.

draulic fittings on the hydraulic e fittings are not the same

. . .

Figure 2

end of the small diameter hose onto the of the hydraulic pump by hand, making t cross thread the connectors.

fittings are hand tight, use two wrenches n the connection. One wrench will prevent e from spinning while tightening, and the will be used to tighten the connectors her. Tighten firmly.

eat this step for the large diameter hydraulic e.

r Frame and Roller Assembly

tiller frame and the roller come shipped as an embly. The tiller does not get shipped with the draulic fluid that is required to drive the tiller. Before dding fluid, the two hydraulic hoses that are attached o the hydraulic pump assembly need to be installed on the tiller.

The large diameter hydraulic hose needs to be attached to the tiller frame. There is a male fitting on the front, right side of the tiller frame. Attach the large hydraulic hose to the tiller frame using the same method that was used when attaching to the hydraulic pump. Refer to Figure 3.

The small diameter hydraulic hose has to be attached to the hydraulic control valve. Refer to Figure 3. Attach the hydraulic hose using the same procedure that was used to attach this hose to the hydraulic pump. There is a short hydraulic hose that is connected to the hydraulic motor on one end that was removed from the hydraulic control valve for shipping (refer to Figure 3). After installing the small diameter hydraulic hose to the control valve, attach the short hose to the male fitting on top of the control valve.

Figure 3

Hydraulic Fluid

The tiller attachment operates using hydraulic fluid. The fluid should be added to the tiller once the hydraulic hoses are connected. The following list includes fluids which are approved for use in this tiller:

- Mobile 424
- Texaco TDH
- Shell Donax
- Farmland TF
- Citgo TF
- Sun Tractor Fluid
- Amoco 1000
- Shell TTF

Remove the dipstick/reservoir cap and add 4.5 gallons of hydraulic fluid as noted above. Replace the dipstick. Recheck the hydraulic fluid after the tiller has been mounted on the tractor and the hydraulic pump has been engaged. The hydraulic hoses, hydraulic pump, motor, and valve, and the hydraulic filter will fill up once the hydraulic pump has been engaged. Hence, the fluid level will then need to be rechecked and more fluid will need to be added to maintain the proper fluid level of the reservoir.

NOTE: Refer to the maintenance section for information pertaining to changing the hydraulic fluid and filter after use.Small Diameter Male FittingLarge Diameter Male F

SECTION 6: PREPARING THE TRACTOR

NOTE: References to LEFT and RIGHT indicate the left and right sides of the tractor and tiller attachment when facing forward in the operator's position.

NOTE: If the tractor is equipped with a mower deck, remove it now. Refer to the tractor's operator's manual for instruction on removing the mower deck and hardware.

IMPORTANT: The use of this tiller attachment requires the use of the weight bracket 190-307-100, and the weight kit part number 190-390-100 on the front of the machine. It is recommended that three weights be used (three 42lb. suitcase weights). Without front weights, steering will be extremely difficult and there is potential for backwards tip over on uneven surfaces. Install these pieces while preparing the tractor for tilling.

Installing the Lift Switch

The lift switch for the tiller attachment requires permanent mounting to the tractor's dash. Remove the wiring harness from the electric lift cylinder, a part of the attachment hitch assembly, by unplugging the connector located near the electric lift cylinder. Refer to Figure 1.

The lift switch is shipped in a separate bag that can be found in the box with the electric lift cylinder.

Drilling a hole in the dash is required to mount the lift switch and a template is provided on page 23 for correct placement of the hole. Retrieve the template from the rear of the book following the instructions from that page, and secure it to the dash panel with tape. Refer to Figure 4. Complete the following steps to properly install the lift switch and electric harness:

- Open the hood of the tractor and carefully inspect the area below the marked hole location as seen in Figure 4. Check the area for wires and secure them as necessary to prevent damage.
- Using a 1/2" drill bit, drill a hole through the plastic dash panel being certain to center on the drill bit on the marked location.
- The hex nut is installed on the lift switch prior to shipping, remove the nut now. Working from underneath the dash, push the switch through the newly drilled hole in the dash panel with the threads showing on the outside and the flat edge of the threads facing right. Refer to Figure 5.

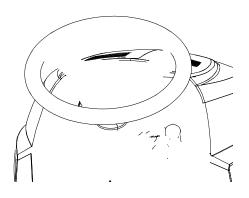


Figure 4

- Secure the lift switch by threading on the nut removed in the last step, now.
- Working under the dash, connect the five slot connector in the lift switch wiring harness to the lift switch.
- Feed the opposite end of the wiring harness, the end with the two slot connector on it, down toward the right side of the frame. Continue routing the harness toward the rear of the tractor between the running board and the right frame, being certain to attach it where it will not get pinched by moving parts.

Figure 5

• Route the wire harness at the back of the tractor over the hitch plate. Then route it toward the left side of the tractor where the connector for the electric lift cylinder will be after the attachment hitch is mounted.

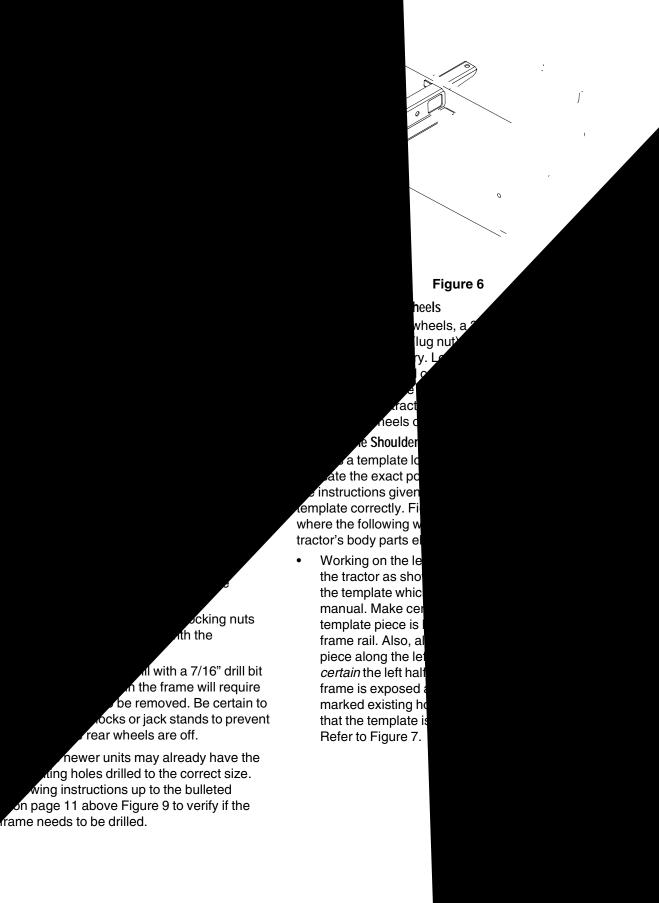


Figure 7

- To mark the hole to ensure proper centering of the new hole to be drilled, place the pointed end of a center punch on the cross hairs of new hole position. Using a hammer, strike the end of the center punch to create a permanent mark in the metal frame and carefully remove the template.
- Using a 7/16" drill bit, set it on the mark just made by the center punch and drill completely through the frame. Carefully remove any sharp edges around the hole with a file.

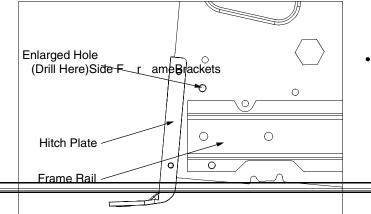


Figure 8

Hydraulic Pump Assembly Hanging Brackets

The hydraulic pump assembly attaches to the tractor using hangers that are permanently affixed to the tractor's frame. These brackets are shipped with the hydraulic pump assembly. The hardware to mount the brackets to the tractor is shipped attached to the brackets and will need to be removed before installing.

The side frame brackets will require two 9/16" wrenches to install on the tractor.

- Install the bolts from the outside of the frame with the threads on the inside of the frame. Use Figure 10 to determine the position of the hole in the frame.
- Holding the bolt through the hole with one hand, slide the small hole of the side frame bracket over the bolt threads making certain that the curved portion of the bracket is facing outward. Refer to Figure 10.

olt threads and other side. These oved when using a

draulic pump s that hold it to the nounted toward the the left and right correct location of

vill require two 3/4"

pracket against the e with the long rear of the tractor. o match those on the holes and part of the bolt

ighten firmly. eed to be removed

SECTION 7: MOUNTING THE TILLER

Installing the Attachment Hitch

The attachment hitch, which has the electric lift cylinder attached to it, attaches to the rear of the tractor's frame over the hitch plate. There is a short clevis pin and cotter pin mounted to the lower portion of the attachment hitch during shipping, remove them now and set them aside.

Holding the attachment hitch with the hitch hooks facing the tractor, place the hitch hooks over the mounting bolts and allow the attachment hitch to rest on the hitch plate of the tractor. Install the clevis pin removed earlier, into the holes that line up between the attachment hitch and the hitch plate, and secure with the cotter pin. This clevis pin holds the attachment hitch in place during use.

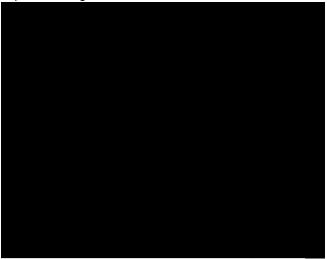


Figure 11

The electric lift wiring harness is mounted near the rear frame of the tractor on the right side. Plug the connector from the electric lift wiring harness into the mated plug on the electric lift cylinder. This will supply electric power to the lift cylinder.

Attaching the Tiller Assembly

Before continuing, be certain that the hydraulic hoses are connected to both the tiller assembly and the hydraulic pump assembly. Set the hydraulic pump assembly directly in front of the tiller on the ground as far as the hoses will allow. Align the tractor so it can be pushed straight back to the tiller attachment.

To attach the tractor and the tiller assembly together, proceed as follows:

 With the tractor not running, push it backwards toward the tiller attachment over the hydraulic pump assembly. **NOTE:** Be careful to insure that the hydraulic pump assembly clears the tractor's transmission as the tractor is moving toward the tiller attachment.

• Release the left and right hitch latches by removing the clevis pin and cotter pin that secure them in a locked position.

Figure 12

- The attachment hitch, which is mounted to the tractor, has a cross bar running through it that the sleeve hitch attaches to. Push the tractor backwards to the point where the crossbar ends slide into the channels below the hitch latches. Doing this will require some aligning of the tiller with the attachment hitch. Once the two are attached, lock the parking brake on the tractor and reinstall the clevis pins that lock the hitch latches into place.
- Remove the clevis pin and spacers from the end of the electric lift cylinder by removing the cotter pin. Slide the clevis pin out and set aside the hardware.
- Maneuver the unattached portion of the electric lift cylinder in between the slotted channels of the sleeve hitch. Raise or lower the cylinder using the lift switch on the tractor's dash if necessary.
- Connect the electric lift cylinder to the sleeve hitch using the clevis pin and spacers removed earlier. One spacer will mount on either side of the electric lift cylinder shaft and the washer will be placed outside of the channels on the end of the clevis pin with the hole in it. Secure the clevis pin with the cotter pin removed earlier.
- Before attaching the hydraulic pump assembly, make certain that the hydraulic hoses are routed to the inside of the hose hook and under the tractor's transmission. Refer to Figure 12 for the location of the hose hook.

Attaching the Hydraulic Pump Assembly

To mount the hydraulic pump assembly to the tractor, make certain that it is placed under the center of the tractor's frame, resting on the ground, with the hydraulic hoses attached. Connect the hydraulic pump assembly as follows:

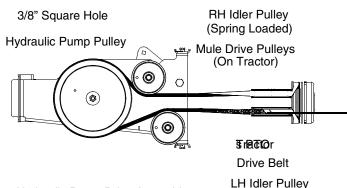
- The rear of the hydraulic pump assembly has a "tongue" on it. The tongue is the flat portion toward the rear of the assembly. Raise the rear of the assembly up and slide the tongue into the slotted portion of the rear mounting bracket. Refer to Figure 13.
- Before raising the front of the hydraulic pump assembly, remove the front hanger rod by removing one of the hairpin clips and sliding the rod out.
- Lift the front of the hydraulic pump assembly and align the holes in the assembly with the holes in the side frame brackets.
- Install the front hanger rod and secure with the hairpin clip removed earlier.

With the hydraulic pump assembly installed, locate the sleeve that surrounds the two hydraulic hoses and slide it toward the hydraulic pump as far as possible. This will provide more protection to the hydraulic hoses where it is necessary.

Installing the PTO Drive Belt

The hydraulic pump drive belt needs to be installed. This belt connects the tractor's PTO to the hydraulic pump which provides power to the tiller attachment. The following describes how the belt is installed:

- Raise the hood of the tractor and locate the PTO pulley on the front of the engine.
- Working from the engine compartment, feed the belt around the front of the PTO pulley and place the last portion of the belt onto the pulley with the Vgroove of the belt facing into the pulley.



Hydraulic Pump Drive Assembly

Figure 13

(Stationary)

- Lying down on the right side of the tractor, take the loose portion of the belt and pull it toward the back of the tractor.
- Keeping light tension on the belt, align the V-groove of the belt into both mule drive pulleys mounted slightly in front of the front axle of the tractor. There should be a single 90° twist of the belt between the PTO pulley and each mule drive pulley.
- Place a 3/8" ratchet head, set to tighten, into the square hole near the right hand idler pulley and apply force. Notice how the pulley moves toward the outside of the tractor. Doing this will make installing the remainder of the belt easier.
- Making certain that the belt has a single 90° twist between the mule drive pulleys and the idler pulleys, and that the flat side of the belt is resting on the idlers, apply pressure to the ratchet and finish routing the belt around the hydraulic pump pulley. Be sure that the V-groove of the belt is set completely in the pulley before releasing the ratchet.
- Recheck the routing of the belt to ensure that it is resting completely in all the grooves of all the pulleys before engaging the PTO.

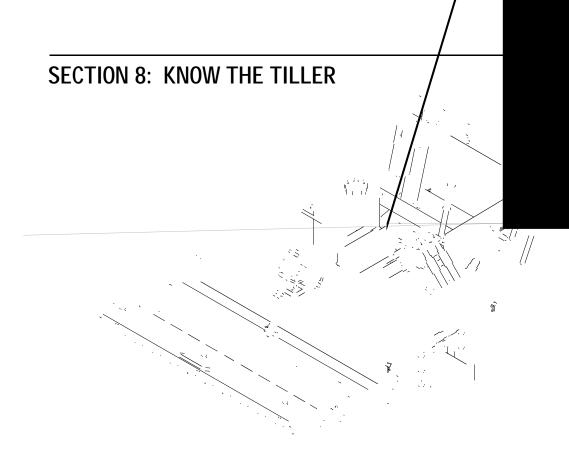


Figure 14

Lift Switch

The lift switch is located on the right side of the steering wheel on the dash panel and is used to raise and lower the tiller attachment and also to determine the depth at which the tines dig into the ground. See Figure 15.

Tine Direction Lever

The tine direction lever is located on the top of the tiller attachment on the right side of the unit. Refer to Figure 14. This lever is used to control which direction the tines turn.

Figure 15

Pushing forward, or up, on the switch will raise the tiller. Pulling down, or back, on the switch will lower the tiller. The electric lifting cylinder will produce a clicking noise when it reaches its maximum lift or lowered height. When this noise is heard, immediately release the switch to prevent damage to the electric lift cylinder.

Figure 16

The lever has three positions. F is the forward tilling position. By pulling the tine direction lever toward the front of the tractor (refer to Figure 16), this will activate the tines into forward tilling motion. Forward tilling is used when cultivating or tilling soft soil.

N is the neutral position. When the lever is in this position, the tiller tines are not in motion. The N position is located between the forward and reverse positions on the lever. Neutral is used whenever transporting the unit.

R is the reverse tilling position. The tine direction lever is pushed toward the back of the machine, or away from the operator to start the tines in the reverse direction. Tines spinning in a reverse direction are used for breaking ground or tilling hard soil.

IMPORTANT: Turn the tractor's PTO into the off position before changing tine direction. Do not move the tine direction lever with the PTO engaged. Doing so will cause damage to the hydraulic motor.

Tiller Tines

The tiller's tines are located under the frame of the tiller. The tines cultivate the soil when placed in contact with the ground while in motion.

The tines are replaceable and wear should be expected. Rate of wear will depend on the amount of time used and the condition of the ground which is being tilled.



WARNING: Tiller tines are sharp and can cause serious injury. Wear heavy gloves and use extra caution when servicing the tines.

Roller

The roller is mounted to the tiller attachment directly behind the tines. It is a heavy duty round screen designed to level the tilled soil without compacting it. The dirt surface after being rolled, helps eliminate the need for raking soil level after tilling. It is spring loaded and fully adjustable so it can be used on variable terrain at all tilling depths.

Hydraulic Pump

The hydraulic pump is a belt driven pump which moves hydraulic fluid to the hydraulic motor on the tiller via hydraulic hoses. It is mounted under the center of the tractor and is activated by the tractor's PTO.

NOTE: The PTO on the tractor will not function while the tractor is in the Reverse speed. Use the tiller while driving forward only.

Hydraulic Reservoir

The hydraulic reservoir is a part of the tiller frame and can be found directly on top of the tiller in the center. It has a vented tank cap with a dipstick attached. It is vented to allow for expansion of the hydraulic fluid as it heats up and expands during normal use. The opening on the top of the reservoir acts a checking and a filling point for the hydraulic fluid.

The hydraulic reservoir holds the oil that drives the tiller tines. It is important to maintain the correct level of fluid in the reservoir to prolong the life of the hydraulic motor.



WARNING: Hydraulic hoses, fittings, and fluid become hot during normal usage. Allow the machine and its related hardware to cool down before checking the fluid level or performing maintenance.

Hydraulic Filter

The hydraulic system on the tiller attachment has a filter that is located directly to the left of the tine direction lever. The filter keeps the hydraulic fluid free from impurities and should be changed according to manufacturer's data as listed in the maintenance section of this manual.

Tiller Stand

The tiller attachment is equipped with a stand which allows the equipment to stand on its own when it is not attached to the tractor. It is located on the front left portion of the tiller frame and when set, will also aid in the reattaching process to the tractor.

Rear Tine Shield

The rear tine shield, as shown in Figure 1, comes shipped as a separate item. The rear tine shield is to be used in place of the roller when the roller is removed. It is a safety device that prevents tilled debris from being thrown from the tiller during use.

SECTION 9: OPERATING THE TILLER

IMPORTANT: Using this tiller attachment requires the use of weight kit bracket 190-307-100 and suitcase weights part number 190-390-100. It is recommended that three weights be used (three 42lb. suitcase weights), especially when using the machine on uneven surfaces. Without front weights, steering will be extremely difficult and there is potential for backwards tip over on uneven surfaces.

Fluid Level

IMPORTANT: Check the tiller's hydraulic fluid level before using the unit as described in the assembly section of this manual. **Read instructions carefully.**



WARNING: Never check the hydraulic oil level immediately after using the tiller. Hydraulic oil gets hot during normal usage and may build pressure in the system.

Engaging the Tiller

NOTE: Refer to the tractor's operator's manual for information concerning starting and stopping the tractor, and location and proper usage of its controls.

Before engaging the tiller, complete the following steps:

- Start the tractor's engine and make certain it is at operating temperature (the engine is warmed up).
- Verify that the PTO is disengaged.
- Lock the parking brake.
- Raise the tiller to its highest point using the lift switch.

Select the tine direction by shifting the tine direction lever into the forward (F) or reverse (R) position depending on the type of tilling to be performed. Set the tractor to full throttle and engage the PTO. The tines will now be turning.

IMPORTANT: Turn the tractor's PTO into the off position before changing tine direction. Do not move the tine direction lever with the PTO engaged. Doing so will cause damage to the hydraulic motor.

To shift the tine selection lever from one position to another, first turn off the PTO and wait for the tines to come to a complete stop. Then shift the lever to any position as necessary as outlined in Section 8.

Tilling Ground Speed

The tilling ground speed is the speed at which the tractor travels while the tiller is set in the ground and working. Correct ground speed is determined by the soil conditions and the depth of cut.

IMPORTANT: Do not attempt to use the tiller attachment while backing up. A safety switch on the tractor will automatically shut off the PTO when the reverse pedal on the tractor is depressed. Always lift the tiller out of the ground before backing up.

When tilling hard ground, with the engine running at full throttle, the ground speed of the tractor should be less than 30% of the top speed of the tractor. This will vary based on the soil. If the engine is slowing at all or the tractor and tiller are vibrating or shaking, the ground speed should be slowed.

When tilling soft or previously tilled ground, a slightly higher speed, up to 50% of the total speed of the tractor is acceptable. Again, if noticeable vibration or shaking of the tiller attachment occur, reduce ground speed.

A slow ground speed while tilling will produce the finest tilled soil and a faster ground speed results in soil that is coarse.

Tilling Depth

The tilling depth is determined using the lift switch. To set the tilling depth:

- Engage the tiller as outlined in the previous section.
- With the tractor, running at full throttle, in position, use the lift switch to lower the tiller into the ground. Be aware that as the tiller penetrates the ground, it will shake and vibrate the tractor initially.

Kit number 190-014-100 is an optional skid shoe kit, available at your Cub Cadet dealer, that is recommended for the tiller attachment. The skid shoes make it simpler to determine tilling depth.

The tines can be lowered from 0" to a maximum 6.5" tilling depth. It is important to set the tiller depth while the tractor is NOT in motion. Come to a complete stop with the tractor before raising or lowering the tiller attachment, especially when the tines are working in the ground.

When tilling hard ground or when tilling an area for the first time, do not till more than 2" at a time. To increase the tilling depth, lower the tiller on successive passes over the area.

If tilling softer or previously tilled soil, tilling up to 3" per pass is acceptable. If vibration or shaking of the tiller attachment occur, the tiller depth is too deep or the tractor's ground speed is excessive.

Using the Roller

When set properly, the roller will help eliminate the need for after till raking and leveling. The roller has several height settings that can be used depending on the depth the tiller is set at.

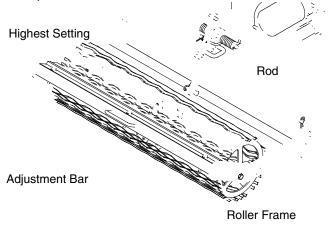


Figure 17

To set the height of the roller, first make sure that the tractor engine is not running and the parking brake is set. Standing on the right side of roller, facing it, hold the u-handle located on the back frame of the roller. While lifting slightly on the u-handle, pull the spring loaded locking rod clear of the adjustment bar and lift the roller up or set it down based on the depth of the tilling to be done. Release the locking rod in one of the adjustment holes in the adjustment bar to lock the roller into position.

For shallow tilling, drop the roller to its lowest position by putting the locking rod into the highest hole of the adjustment bar. For deeper tilling, continue to raise the roller by using lower holes in the adjustment bar. The lowest hole (highest setting) is used for transporting the tiller.

Using the Rear Tine Shield

The rear tine shield that was shipped separately with the tiller assembly must be in place whenever the tiller is being used without the roller.

To install the rear tine shield:

- Remove the roller assembly completely by removing the two bolts that attach it to the tiller frame and disconnecting it from the adjustment bar.
- Remove the long rod that holds the shorter tine shield that is used with the roller.
- In place of the shorter tine shield just removed, install the larger tine shield using the existing hardware.

Figure 18

Figure 18 shows the larger rear tine shield in place with the adjustment chain holding the tine shield in a maintenance position. When operating the tiller, adjust the chain so the rear tine shield touches the ground. Doing this will help to prevent objects from being thrown away from the working tines.

Operating Tips

For best results while tilling, always till the area at least twice. Always till at right angles as shown in Figure 19.

Turning

The tiller attachment was intended to be used in a straight line only. Very slight turns while tilling can be achieved by traveling at a slower ground speed, but sharp turns during tilling can put excess stress on the frame of the tiller and tractor and will cause the equipment to shake and vibrate excessively.

Figure 19

Clearance

The left hand side of the tiller attachment lines up evenly with the left hand tires of the tractor. To get nearest to an object while tilling, line the object up just to the left side of the tractor.

The tiller attachment makes the tractor noticeably longer. Be careful in turns to watch the rear end clearance of the tiller attachment. In a tight turn, the tiller sticks out and may strike an object that the tractor itself normally would not.

Wet Soil

Tilling soil that is wet will result in the formation of large clumps of soil that will dry solid. The potential to get the tractor stuck while tilling is increased substantially while tilling wet soil. If the tractor begins spinning its wheels in this situation, shut the PTO off on the tractor, raise the tiller out of the ground, and attempt to drive out of the area. Resume tilling after the ground has dried.

Cub Cadet offers an optional set of agricultural tires that would help to increase traction o12.1(os1(o)-12.33(t tr)-6.3()12.(um)

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If the object does not dislodge using this method and the tines continue to not spin:

- Shut off the PTO immediately, shift the tine direction lever to neutral (N), raise the tiller to its highest position, and turn the tractor engine off.
- Lift the roller to its highest position to create easier access to the tines. Raise the rear deflector, if necessary, and locate the object that is binding the tines.

SECTION 10: MAINTENANCE



WARNING: Before performing any adjustments, be certain that the tractor's engine is not running and the parking brake is set. If working on the tines, raise the tiller to its highest point and place blocks under the edges of the tiller frame to prevent it from dropping.

Cleaning

It is important after every use to clean the tiller, especially around the tines. It is much easier to clean the dirt off of the tiller while it is fresh than if it is left to dry for a sustained period.

The area around the tines is the most important to clean for this is the area that receives actual contact with the ground. Using a garden hose in this area as well as on the top of the tiller is acceptable, but it is important not to use direct water pressure on the electric lift cylinder. After washing the underside of the tiller, start the tiller tines in motion for a couple minutes to help disperse any water that may lie in the bearings and tine shaft areas causing excessive corrosion.

Also, avoid direct water contact with the tank cap on top of the hydraulic reservoir. Wipe this area clean with a dry rag to avoid possible contamination while checking the hydraulic fluid.

It is recommended also that the machine be dried off after washing, if possible. Water that sits on a machine can cause corrosion over time. An air hose that is attached to an air compressor is ideal for drying machinery such as this. If that is not available, a towel will suffice. Doing this will help prolong the life and appearance of the tiller.

Lubrication

There are several lubrication points on the tiller attachment. Using a lithium based lubricant, white lithium spray lube is recommended, contact all the pivot points where the tiller pivots when raising and lowering. These are where the sleeve hitch, the attachment hitch, and the electric lift cylinder contact the tiller frame. Using a broom handle or heavy stick, dislodge the object from between the tines and the housing. If it is necessary to reach into the tine area with your hand to remove an object, use caution around the tines which may be sharp.



WARNING: Tiller tines are sharp and can cause serious injury. Wear heavy gloves and use extra caution when servicing the tines.

The attaching clips and the point where they pass through their pins should also be lubricated. This should be done every 10 running hours on the tiller to prevent corrosion and maintain free movement.

The roller needs to be lubricated in several areas. On each end of the roller shaft that runs through the middle of the roller is a bearing. Each bearing has a grease fitting with a removable cap that will require a standard grease gun to lubricate every 25 running hours. Be certain to replace the grease fitting cap after lubricating to prevent contamination.

Also on the roller, use white lithium spray grease on the spring loaded locking rod where it passes through the adjustment bar, and where the compression spring is on the long side of the locking rod. Just above the locking rod is a clevis pin surrounded by two springs, lubricate this area also. This spring loaded section allows the roller to fluctuate and follow uneven ground.

The point where the roller frame attaches to the tiller frame is a pivot point. The two attaching bolts, where the roller assembly pivots, need lubrication also.

Changing Hydraulic Filter and Fluid



WARNING: Hydraulic hoses, fittings, and fluid become hot during normal usage. Allow the machine and its related hardware to cool down before checking the fluid level or performing maintenance.

Hydraulic Filter

The hydraulic filter should be changed every 50 running hours on the tiller. To change the filter:

- Place a pan (shorter than 1.5") under the oil filter to collect the oil that remains in filter when not using.
- Use a filter wrench to loosen the filter. Drain excess oil into the pan.
- Install a new filter, part #723-0405, by first moistening the o-ring on the new filter with hydraulic oil. Tighten the filter until the o-ring makes contact with the filter base, then tighten 1/4 turn.

With the new filter in place, remove all tools used to change the filter from the tiller:

- Start the tiller in motion for about one minute in order to circulate the oil through the new filter.
- Turn off the tiller and the tractor, lower the tiller until the top flat portion of the tiller is level with the ground, and check the hydraulic fluid.
- Remove the dipstick, wipe it clean and tighten it back down on the hydraulic reservoir. Remove it again and check the level of the fluid on the dipstick. Add hydraulic fluid as necessary.

The following list includes fluids which are approved for use in this tiller:

- Mobile 424
- Texaco TDH
- Shell Donax
- Farmland TF
- Citgo TF
- Sun Tractor Fluid
- Amoco 1000
- Shell TTF

Hydraulic Fluid

The hydraulic fluid in the tiller attachment should be changed after every 100 hours of operation. To change the fluid correctly:

- Remove the tiller attachment from the tractor (refer to the Storage section).
- Carefully pivot the tiller forward so it rests on the tines (do NOT use the tiller stand for this procedure), until the front point of the sleeve hitch is touching the ground.
- Locate the drain plug on the front left side of the tiller. It is slightly above the front deflector shield. Refer to Figure 20.
- A drain pan that will hold up to five gallons is recommended for collecting the used oil. Place the pan under the drain plug and using a 5/8" wrench, remove the drain plug and drain the fluid completely.
- Before reinstalling the drain plug, check the gasket for cracks or tearing. If necessary, replace the gasket.
- Reinstall the drain plug and tighten.
- Set tiller back to a level position and set the tiller stand in place for stability.

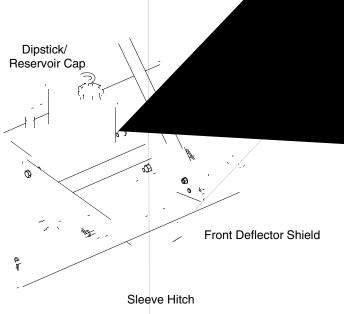


Figure 20

- Remove the dipstick from the hydraulic fluid reservoir and add four gallons of an approved hydraulic fluid as noted in the previous list.
- Add additional fluid as necessary to reach a full reading on the dipstick. The hydraulic reservoir will hold up to 4.5 gallons when empty, but in some cases it is not possible to remove *all* of the fluid. Using this method will help to prevent overfill when refilling.

Replacing the Tines

The tiller tines will wear out over time based on the amount of use and type of soil being tilled. There are 20 replaceable tines on the tiller. When the tines are new, there is 1.5" inches across the cutting end of the tine as shown in the window of Figure 21. When this distance measures less than one inch, *all the tines need to be replaced*. If the tines get used past this point, they may become brittle and break off during use causing a dangerous situation.

WARNING: Tiller tines are sharp and can cause serious injury. Wear heavy gloves and use extra caution when servicing the tines.

Removing the tiller tines requires a 9/16" and 3/4" wrench or socket. The 3/4" wrench fits on the bolt head and the 9/16" wrench fits on the nut. Remove both inner and outer shoulder bolts to remove one tine. Take note of the order of the shoulder bolts and washers as they hold the tine on. Refer to Figure 21.

Replace only one tine at a time. This will help to insure the correct positioning of the tines as they are mounted on the tine assembly. When installing the new tine, be certain that the longer shoulder bolt is in the inner hole toward the center of the tine assembly. Realign the bolts and washers as shown in Figure 21 and retighten firmly.

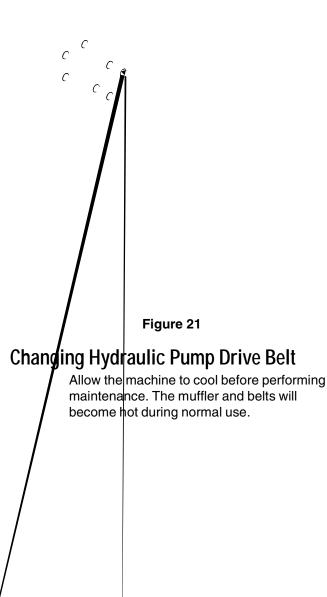


Figure 22

The hydraulic pump drive belt is located under the tractor and is driven by the PTO of the tractor. To remove the belt for inspection or replacement, proceed as follows:

- Crouch or lie next to the tractor on the right side and locate the hydraulic pump assembly underneath the center of the tractor frame. Refer to Figure 22.
- The idler pulley on the right side is attached to the idler arm and is spring loaded to provide constant tension to the pulley which keeps the belt tight.
- There is a 3/8" square hole on the outside edge of the idler arm which is used to relieve belt tension. Insert the head of a 3/8" ratchet into the square hole.
- With the ratchet set to tighten, pull on the ratchet and notice that belt tension is being loosened.
- While holding the ratchet to keep the belt loose, carefully remove the belt from the large hydraulic pump pulley and the other stationary idler pulley.
- With the belt removed from the hydraulic pump assembly, raise the hood of the tractor and locate the belt where it rests in the pulley of the PTO. The belt at this point is free of obstruction and can be removed through the hood opening.

Inspect the belt for any cracks or fraying. Replace if necessary. Before installing a new belt, check pulley shafts and bearings for excessive end play and wear. Make certain that they turn smoothly and freely.

Check pulley grooves for debris build-up or wear. If the pulleys require cleaning, moisten a cloth with a nonflammable degreasing agent to clean out the grooves.

Refer to the Mounting the Tiller section earlier in this manual for instructions on installing the hydraulic pump drive belt.

Hydraulic Hoses

WARNING: Hydraulic hoses, fittings, and fluid become hot during normal usage. Allow the machine and its related hardware to cool down before performing maintenance.

The hydraulic hoses need to be checked regularly for cracks or leaks. Hydraulic fittings also need to be checked for leaks or damage. Replace any hose that shows signs of cracking or leaking to avoid a dangerous situation.

Hydraulic fittings that are leaking should be checked to verify that they are tight. If further leaking persists after tightening, the fitting or the hose may need to be replaced.

If fluid is lost during repairs, be sure to check the fluid level and add as necessary.

SECTION 11: STORAGE

NOTE: Before removing the tiller attachment for storage, perform all lubrication maintenance as outlined in the Maintenance section.

Removing the Tiller

NOTE: When removing the tiller attachment, because the tiller is awkward, it is recommended that the tiller be removed in a place that will not require it to be moved regularly. It would also be helpful when removing the tiller to allow approximately five feet of space in front of the tractor. This will make the removal process simpler.

Setting the Tiller Stand

Before removing the tiller from the tractor for storage, it is recommended that the roller be set in the lowest position and the tiller stand be set.

To set the tiller stand, remove the hairpin clip (refer to Figure 23) and clevis pin. The tiller stand will be free to slide in its bracket. Align the tiller stand so the storage position hole is lined up with the hole in the tiller stand bracket and reinstall the clevis pin and hairpin clip.

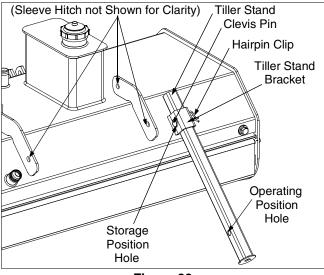


Figure 23

Removing the Hydraulic Pump Assembly

To remove the hydraulic pump assembly, the hydraulic pump drive belt must first be removed. See the Maintenance section for this procedure.

Once the belt is removed, proceed as follows:

• To remove the front hanger rod which suspends the front of the hydraulic pump assembly, there are two hairpin clips that hold the front hanger rod in place. There is one on each side of the tractors frame. Only one of these pins needs to be removed. Remove hairpin clip on the left side of the tractor.

- Supporting the weight of the hydraulic pump assembly with one hand, use the other hand to slide the front hanger rod out the right side of the tractor. Set the front of the hydraulic pump assembly carefully on the ground.
- The rear of the hydraulic pump assembly is supported by a tongue that is slid inside the rear mounting bracket mounted to the tractor. Using both hands, carefully pull the hydraulic pump assembly towards the front of the tractor and the assembly will become free of the rear mounting bracket.

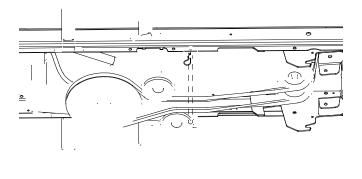


Figure 24

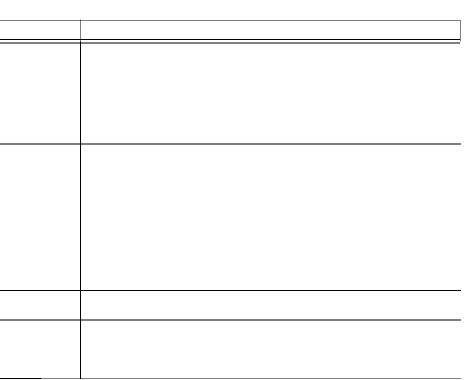
At this point, leave the hydraulic pump assembly setting under the center of the tractor's frame. With the tiller unattached, the tractor can be pushed over the hydraulic pump assembly with hydraulic hoses still attached.

Releasing the Sleeve Hitch/Removing the Tiller

To release the sleeve hitch from the attachment hitch on the tractor, locate these items in Figure 25 and proceed as follows:

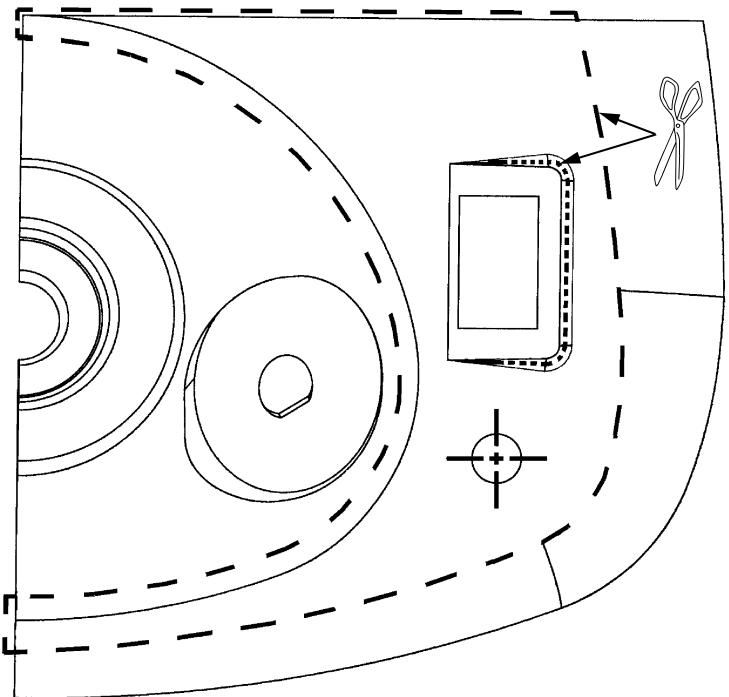
- Remove the lower clevis pin on the electric lift cylinder by first removing the hairpin clip and sliding out the clevis pin from the right side. Note the order of the spacers and washer as they rest on the clevis pin.
- Release the left and right hitch latches. To do this requires the removal of the clevis pin which locks the latches in place. Pull the hairpin and slide the clevis pin out of the sleeve hitch on both sides. At this point the pivoting hitch latches are free.
- Place the tractor transmission release lever into the released position and release the parking brake.

	There is enough clearance under the left side of the transmission for the hydraulic pump assembly to come out without having to raise the tractor. <u>Removing the Attachment Hitch</u>
	The attachment hitch, which has the electric lift cylinder attached to it, is still attached to the tractor. To remove the attachment hitch it is necessary to first unplug the electric lift cylinder from the electric lift harness. This is located between the rear fender of the tractor and the electric lift cylinder itself.
RH Hitch Latch	It is recommended that the attachment hitch be removed during non-tilling usage of the tractor. To remove the attachment hitch, proceed as follows:
	• Follow the wires from the electric lift cylinder until the connector is found. Pull the connectors apart.
allow the tractor, unted, to be the sleeve hitch tor away a few still lying on the Carefully push the	• Pull the hairpin clip out of the clevis pin which holds the attachment hitch to the hitch plate of the tractor and remove the clevis pin. Refer to Figure 11.
	• Using both hands, lift the attachment hitch straight up approximately one inch in order to get the hanger slots off of the shoulder bolts they are resting on. Once this is done, pull the attachment hitch away from the machine and set it aside.
ot damage the bly.	IMPORTANT: Be certain to store all removed hardware in a safe place to insure proper reinstallation later.
SHOOTING	



SECTION 13: TEMPLATES

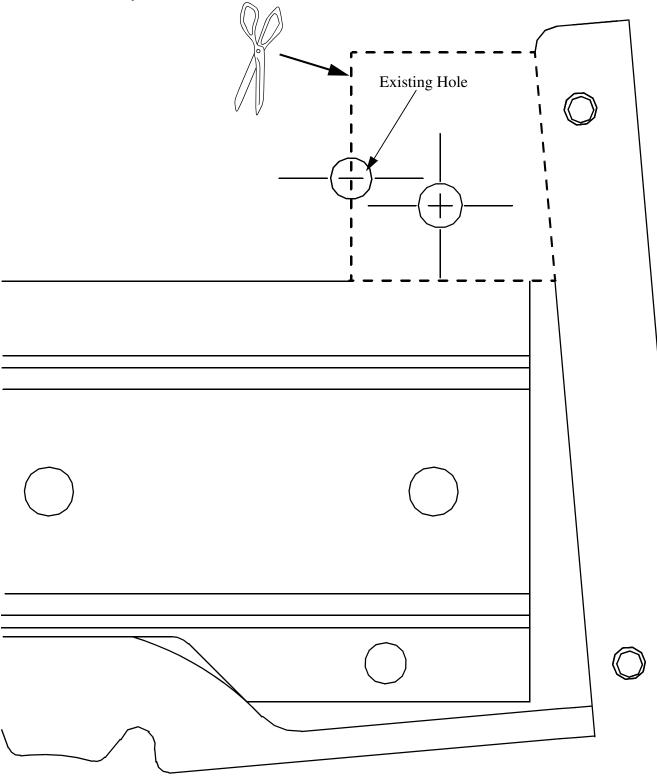
Dash Panel Template



Instructions:

- Carefully cut the template along the dotted lines only.
 Tape the template into position on the dash panel.
 Continue following instruction given on page 9, Installing the Lift Switch.

Rear Frame Template



Instructions:

- 1. Carefully cut the template along the dotted lines only.
- 2. Continue following instruction given on page 10, Attachment Hitch Mounting Bolts.

MANUFACTURER'S LIMITED WARRANTY FOR:



TWO-YEAR RESIDENTIAL ONE-YEAR COMMERCIAL

Proper maintenance of your Cub Cadet equipment is the owner's responsibility. Follow the instructions in your operator's manual for correct lubricants and maintenance schedule. Your Cub Cadet dealer carries a complete line of quality lubricants and filters for your equipment's engine, transmission, chassis and attachments.

Riding mowers, lawn tractors, garden tractors, Cub Cadet attachments and home maintenance products

This limited warranty for residential users, covers any defect in materials or workmanship in your Cub Cadet equipment for two years from the date of purchase for the first user purchaser. We will replace or repair any part or parts without charge through your authorized Cub Cadet dealer.

Batteries have a one-year prorated limited warranty with 100% replacement during the first three months.

V-belts for either the traction drive or any attachments are covered for one year only.

Cub Cadet equipment used commercially is warranted for one year only.

(Commercial use is defined as either having hired operators or used for income producing purposes.)

Items not covered

The warranty does not cover routine maintenance items such as lubricants, filters (oil, fuel, air and hydraulic), cleaning, tune-ups, brake and/or clutch inspection, adjustments made as part of normal maintenance, blade sharpening, set-up, abuse, accidents and normal wear. It does not cover incidental costs such as transporting your equipment to and from the dealer, telephone charges or renting a product temporarily to replace a warranted product.

There is no other express warranty.

How to obtain service

Contact your authorized Cub Cadet servicing dealer who sold you your Cub Cadet equipment. If this dealer is not available, see the Consumer Yellow Pages under "lawn mowers" for the name of a dealer near you.

If you need further assistance in finding an authorized Cub Cadet servicing dealer, contact:

Cub Cadet Corporation Post Office Box 368023 Cleveland, Ohio 44136

How does state law apply?

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.